

COMMERCIAL SCENARIO  
CARCINOGENS

June 2007

Cancer Risk Formula (with volatilization factor):

$$Cs = [(TR * BWa * AT) / (EF * ED * ((SFo * CF * IRSa) + (SFi * IRAa * (1/VF + 1/PEF)) + (SFo * CF * RAFd * DFA)))]$$

<b>BENZENE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	7.2
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SFo (Chemical specific oral cancer slope factor - kg-day/mg; IRIS, January 2007)	5.50E-02
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRSa (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
SFi (Chemical specific inhalation slope factor - kg-day/mg; IRIS, January 2007)	9.00E-03
IRRa (Adult inhalation rate - m^3/day; EPA, August 1997)	13
VF (Volatilization factor - m^3/kg; EPA, May 1996)	3133
PEF (Particulate emission factor - m^3/kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPAIII, Dec. 1995)	0.0005
DFa (Adult dermal factor - mg/day; EPA, July 2004)	66

<b>1,2-DICHLOROETHANE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	3.2
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SFo (Chemical specific oral cancer slope factor - kg-day/mg; IRIS, January 2007)	9.10E-02
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRSa (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
SFi (Chemical specific inhalation slope factor - kg-day/mg; IRIS, January 2007)	9.10E-02
IRRa (Adult inhalation rate - m^3/day; EPA, August 1997)	13
VF (Volatilization factor - m^3/kg; EPA, May 1996)	13628
PEF (Particulate emission factor - m^3/kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPAIII, Dec. 1995)	0.03
DFa (Adult dermal factor - mg/day; EPA, July 2004)	66

<b>1,2-DIBROMOETHANE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	0.1
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SF <sub>o</sub> (Chemical specific oral cancer slope factor - kg-day/mg; IRIS, January 2007)	2.00E+00
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRS <sub>a</sub> (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
SF <sub>i</sub> (Chemical specific inhalation slope factor - kg-day/mg; IRIS, January 2007)	2.10E+00
IRAA (Adult inhalation rate - m <sup>3</sup> /day; EPA, August 1997)	13
VF (Volatilization factor - m <sup>3</sup> /kg; EPA, May 1996)	11893
PEF (Particulate emission factor - m <sup>3</sup> /kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPAIII, Dec. 1995)	0.03
DF <sub>a</sub> (Adult dermal factor - mg/day; EPA, July 2004)	66

Cancer Risk Formula (without volatilization factor):

$$Cs = [(TR * BWa * AT) / (EF * ED * ((SF<sub>o</sub> * CF * IRS<sub>a</sub>) + (SF<sub>o</sub> * IRAA * 1 / PEF) + (SF<sub>o</sub> * CF * RAFd * DF<sub>a</sub>)))]$$

<b>BENZ(A)ANTHRACENE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	3.9
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SF <sub>o</sub> (Chemical specific oral cancer slope factor - kg-day/mg; EPA, March 1993)	7.30E-01
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRS <sub>a</sub> (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
IRAA (Adult inhalation rate - m <sup>3</sup> /day; EPA, August 1997)	13
PEF (Particulate emission factor - m <sup>3</sup> /kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPA July 2004)	0.13
DF <sub>a</sub> (Adult dermal factor - mg/day; EPA, July 2004)	66

<b>BENZO(A)PYRENE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	0.39
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SF <sub>o</sub> (Chemical specific oral cancer slope factor - kg-day/mg; IRIS, January 2007)	7.30E+00
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRS <sub>a</sub> (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
IRAA (Adult inhalation rate - m <sup>3</sup> /day; EPA, August 1997)	13
PEF (Particulate emission factor - m <sup>3</sup> /kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPA July 2004)	0.13
DF <sub>a</sub> (Adult dermal factor - mg/day; EPA, July 2004)	66

<b>BENZO(B)FLUORANTHENE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	3.9
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SFo (Chemical specific oral cancer slope factor - kg-day/mg; EPA, March 1993)	7.30E-01
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRSa (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
IRRa (Adult inhalation rate - m^3/day; EPA, August 1997)	13
PEF (Particulate emission factor - m^3/kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPA July 2004)	0.13
DFa (Adult dermal factor - mg/day; EPA, July 2004)	66

<b>BENZO(K)FLUORANTHENE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	39
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SFo (Chemical specific oral cancer slope factor - kg-day/mg; EPA, March 1993)	7.30E-02
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRSa (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
IRRa (Adult inhalation rate - m^3/day; EPA, August 1997)	13
PEF (Particulate emission factor - m^3/kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPA July 2004)	0.13
DFa (Adult dermal factor - mg/day; EPA, July 2004)	66

<b>DIBENZO(A,H)ANTHRACENE</b>	
Parameters	Values
Cs (Soil concentration - mg/kg)	0.39
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SFo (Chemical specific oral cancer slope factor - kg-day/mg; EPA, March 1993)	7.30E+00
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRSa (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
IRRa (Adult inhalation rate - m^3/day; EPA, August 1997)	13
PEF (Particulate emission factor - m^3/kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPA July 2004)	0.13
DFa (Adult dermal factor - mg/day; EPA, July 2004)	66

CHRYSENE	
Parameters	Values
Cs (Soil concentration - mg/kg)	387
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SF <sub>o</sub> (Chemical specific oral cancer slope factor - kg-day/mg; EPA, March 1993)	7.30E-03
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRS <sub>a</sub> (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
IR <sub>Aa</sub> (Adult inhalation rate - m <sup>3</sup> /day; EPA, August 1997)	13
PEF (Particulate emission factor - m <sup>3</sup> /kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPA July 2004)	0.13
DF <sub>a</sub> (Adult dermal factor - mg/day; EPA, July 2004)	66

INDENO(1,2,3-CD)PYRENE	
Parameters	Values
Cs (Soil concentration - mg/kg)	3.9
TR (Target cancer risk)	1.E-06
BWa (Adult body weight - kg; EPA, August 1997)	70
AT (Averaging time - day; EPA, August 1997)	27375
EF (Exposure frequency - day/yr; EPA, December 1991)	250
ED (Exposure duration - yr; EPA, December 1991)	25
SF <sub>o</sub> (Chemical specific oral cancer slope factor - kg-day/mg; EPA, March 1993)	7.30E-01
CF (Conversion factor - kg/mg; EPA, December 1991)	1.E-06
IRS <sub>a</sub> (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	100
IR <sub>Aa</sub> (Adult inhalation rate - m <sup>3</sup> /day; EPA, August 1997)	13
PEF (Particulate emission factor - m <sup>3</sup> /kg; EPA, May 1996)	1.10E+09
RAFd (Chemical specific dermal relative absorption factor - unitless; EPA July 2004)	0.13
DF <sub>a</sub> (Adult dermal factor - mg/day; EPA, July 2004)	66